

Violence in Healthcare Facilities: Lessons From the Veterans Health Administration

Michael J. Hodgson, MD, MPH

Richard Reed, MSW

Thomas Craig, MD

Frances Murphy, MD, MPH

Larry Lehmann, MD, MPH

Linda Belton, RN, MPH

Nick Warren, ScD

Goals: The authors examined assault frequency and risk factors in health care. **Methods:** The authors conducted a cross-sectional questionnaire survey in 142 hospitals. Analyses are presented at the level of the individual and aggregated by facility. **Results:** Thirteen percent of employees described at least 1 assault in the last year; the proportion assaulted per facility ranged from 1% to 26%. Patients were the most common assaulters. Working in geriatrics, mental health, and rehabilitation or in nursing represented a high risk for assault. Hours of work and work patterns represented major risk factors for assault, as were higher measures of organizational stress. The penetration of training in alternate dispute resolution strategies was associated with lower rates of assaults. **Conclusions:** Although work in health care is associated with high rates of assaults, closer scrutiny suggests specific possible intervention strategies. (J Occup Environ Med. 2004;46:1158–1165)

Reports from surveillance programs^{1,2} and healthcare systems^{3,4} have consistently identified patient assaults as a major problem in healthcare settings. The Bureau of Labor Statistics⁵ identified that over 50% of all assaults and 10% of all back injuries in the workplace reported to the Department of Labor resulted from patient attacks on providers. The National Crime Victimization survey suggests that nurses, mental health workers, and police have, respectively, an approximately 2-, 4, and 5-fold risk of occupationally related assault over the population at large.⁶ Despite these data, underreporting may minimize the dramatic importance of violence. Lanza et al.³ identified underreporting rates of 80%. A comparison of reporting systems suggested a 15-fold underreporting.² A substantial proportion of assaults results from “repeat assaulters”^{7–10}

The Veterans Health Administration (VHA) has conducted systematic training and education in prevention and management of disruptive behaviors since the 1980s.¹¹ These efforts have evolved from training consisting of a single day in the early 1980s to a 2-day/16-hour block course ideally attended by all individuals in a facility or at least in high-risk groups. This training is provided by local trainers, trained by a network of master trainers who attend an annual conference and whose skills are reviewed systematically, resulting in subsequent “certification.” The training consists of four modules: an overview/introduction to violence in the workplace, personal safety skills, deescalation,

From the Occupational Health Program, Office of Public Health and Environmental Hazards; the Employee Education Service; the Office of Quality and Performance, Office of the Deputy Under Secretary for Policy and Coordination; Mental Health Strategic Healthcare Group; and Veterans Integrated Service Network 11; all Veterans Health Administration and the Occupational and Environmental Health Division, University of Connecticut Health Center.

Address correspondence to: Michael Hodgson, MD, MPH, Veterans Administration; E-mail address: muh7@mail.va.gov.

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and therapeutic containment. The latter three require hands-on training and practice.

In 2000, the VHA formed a National Taskforce on Violence with representation from important VHA organizational units, labor partners, and outside agencies. That group reviewed violence within VHA, identified policy weaknesses and potential solutions, and made recommendations that included conducting a national survey. The goal was to identify the actual prevalence, perpetrators, causes of incidents, and facility-level characteristics that might guide intervention strategies. The authors present the results here publicly for the following reasons.

- VHA is the largest integrated healthcare delivery system in North America and may provide representative data to guide other systems through the same issues;
- No data have explored actual assault rates in healthcare environments in a large system to provide estimates of rates in the United States;
- This survey provides an opportunity to guide strategic planning by defining rates of assault and characterizing higher- and lower-risk areas in hospitals and work assignment; and
- The survey provides an opportunity to identify facility-level characteristics associated with higher and lower rates of assaults; these may be important in developing intervention strategies.

Methods

Instrument

The overall survey for the employee survey was assembled using previously developed items from a variety of tools. An organizational development survey (Organizational Assessment Survey [OAS]), developed by the Office of Personnel Management,¹² provided 78 items that factor analysis identified as important indicators of employee satisfaction and organizational effective-

ness. Factor analysis grouped these items into 14 constructs. Five additional items measuring constructs related to job stress (job demands, job control, role conflict, social support, and safety climate) were derived from an instrument provided by the National Institute for Occupational Safety and Health.^{13,14} Questions from the Bureau of Labor Statistics addressed hours of work and shift work. Frequency of work organization characteristics such as mandatory overtime, switching shifts, and floating were obtained from a survey on work stress developed by the Federal Aviation Administration. Finally, questions were included from the U.S. Postal Worker Survey¹⁵ assaults (7 items), assessing the number of incidents experienced in the last year. Questions from the National Crime Victimization Survey⁶ addressed perception of safety and physical infrastructure characteristics for violence prevention (key cards, guards, controlled entrance). The analysis reduced the original 7 response categories for assault frequency in the last year to 5: none, 1, 2–5, 6–10, and more than 10. These categories also served to examine risk factors for assaults. The survey inquired in greater detail about the perpetrator and cause of the most recent incident. A copy of the instrument is available from the authors.

Population

All full- and part-time VHA employees were eligible to participate. Contract employees such as those who worked off-site, house officers who are not paid through the VHA payroll system, and *per-diem* nurses who were paid through an agency were not included.

Survey Conduct

The violence survey was part of a broader national survey (Warren and Hodgson: Work Organization, Employee Health, and Quality/Safety of Patient Care, American Public Health Association, 2002, Abstract #46,578). A survey coordinator was

identified at every facility. That survey coordinator received electronic posters for dissemination, a series of e-mails served as weekly reminders, and announcements were made on the national weekly hotline calls. A copy of the instrument was distributed to every employee. To assure anonymity, no personal identifiers were collected. No attempts at follow up or identification of nonresponders for response rate enhancement were undertaken to respect labor partners' concerns about coercion and possible reprisals.

Data Analysis

Data were returned to an independent contractor for scanning, data cleaning, and editing. Data were examined using the Statistical Package for the Social Sciences, version 11.5.¹⁶

Data are presented at the level of individuals (72,349 usable responses) and of the facility (aggregated to 139 usable responses). Data for the former approach are contained solely within the survey. Additional data for the second approach come from records of VHA's Employee Education System, which manages the Prevention and Management of Disruptive Behaviors and Alternative Dispute Resolution programs and records delivered training and granted certificates.

Employee survey data were analyzed at the individual level to derive factors using traditional data reduction strategies. Factor analysis (SPSS: principal components analysis, varimax rotation) using the complete dataset identified factors from the 94 individual items derived from the OAS and NIOSH instruments. Twenty-three factors are reported with eigenvalues greater than 1. Items that had no factor loadings greater than 0.3 were excluded from further analysis; the remaining items were assigned to factors based on their highest loading score. Factor scores were calculated as the mean value of the component item responses. Factors were labeled with

TABLE 1

Individual-Level Factors (with metafactors onto which exposure factors loaded)

Initial factors	No. of items	Cronbach Alpha	Metafactor (individual level)	Metafactor (facility level)
Leadership	9	0.9295	Employee focus	Employee focus
Resources	9	0.8630	Employee focus	Employee focus
Rewards and recognition	6	0.8594	Employee focus	Employee focus
Planning and evaluation	6	0.8203	Employee focus	Employee focus
Diversity acceptance	6	0.8890	Employee focus	Social support
Employee development	5	0.8526	Employee focus	Employee focus
Cooperation	4	0.8299	Employee focus	Employee focus
Supervisory support	4	0.8935	Employee focus	Employee focus
Innovation	5	0.8935	Employee focus	Employee Focus
Customer service	3	0.8195	Employee focus	Employee focus
Work and family balance	3	0.5740	Employee focus	Social support
Conflict resolution	2	0.7964	Employee focus	Employee focus
Change assistance	2	0.7184	Employee focus	Employee focus
Pay satisfaction	single item	—	Employee focus	Pay satisfaction
Job control	3	0.7834	Employee focus	Employee focus
Safety climate	4	0.8823	Employee focus	Employee focus
Coworker support	2	0.7460	Employee focus	Social support
Role conflict	2	0.3243	Professional demands	Professional demands
Job demands	3	0.7436	Professional demands	Professional demands
Outcome scales				
Quality	2	0.7523	Separate outcome	Separate outcome
Satisfaction	4	0.7859	Separate outcome	Separate outcome
Turnover intention	2	0.6814	Separate outcome	Separate outcome
Stress	2	0.8424	Separate outcome	Separate outcome

self-explanatory terms agreed on by the survey committee. Four of these factors represent employee perceptions of “outcomes” resulting from perceived working conditions. These include overall satisfaction, overall quality, turnover likelihood, and stress at work. The authors consider the remaining 19 organizational and psychosocial assessment measures as “exposure” measures, or determinants or drivers of outcomes. Table 1 presents the 23 factors and the items from which they were derived.

Regression models were developed initially using “complete” models (“enter” command in SPSS regression procedures) and further examined using stepwise procedures to explore interactions. Because of the strong collinearity between the 19 independent or “exposure” determinants, regression analyses were unable to develop stable models. Therefore a second-order round of factor analyses using the individual-level data on the 19 independent factors defined 2 “metafactors,” referred to as “exposure metafactors.” The first accounted for 45% of the

variance in the 4 outcome factors and was labeled “employee focus.” The second (accounting for 6%) consisted of the job demands and role conflict factors, elements of traditional “work stress” models,^{13,14} here called “professional demands.” Similar analyses at the facility level identified 4 factors (the same professional demands, pay satisfaction as a single item, and 2 subfactors from the old “employee focus” factor, termed, respectively, social support and employee focus). For consistency, data are presented here using the 4 rather than the 2 metafactor analyses. Regression models for individuals were developed both as logistic (any) and continuous (number of assaults). Models were run both for individual-level ($n = 72,349$) and facility-level ($n = 139$) data.

Results

Between October and November 26, 2002, 74,662 responses were received for a response rate of 36.5%. Over 70% of administrative (17% of all respondents) and approximately 33% each of clinical/professional,

clerical, technical, and wage-grade staff responded. No attempt was made to weight differential response rates in the summary presentations. There was a statistically significant relationship between facility response rate and the metafactor employee focus ($r = 0.29$, $P < 0.0001$). There was no such relationship between response rate and either professional demands ($r = 0.02$) or assaults ($r = 0.06$).

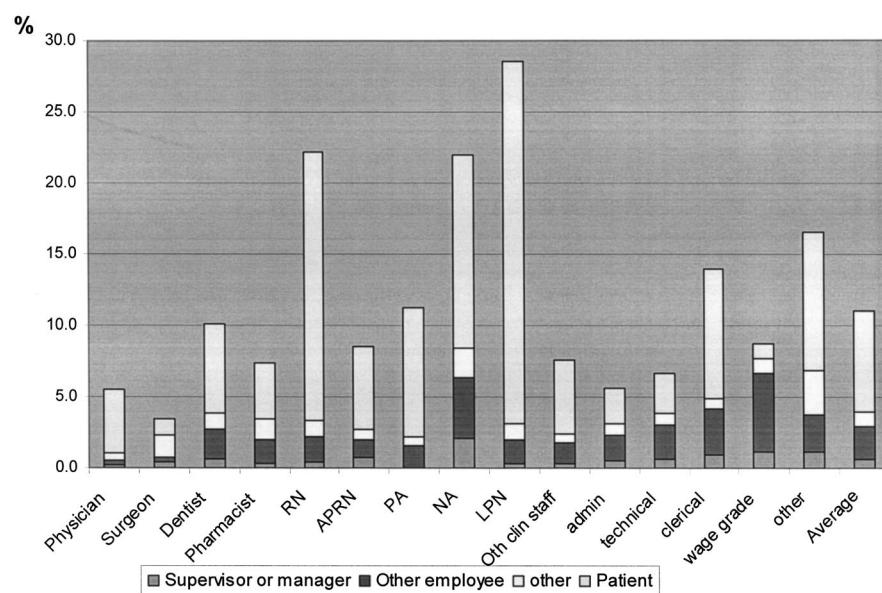
Overall, 72,349 individuals provided responses usable for the description of violence. On average, across facilities, 13% of employees described at least 1 assault in the last year, with a range from a minimum of 1% to a maximum of 26%. Table 2 presents the frequencies of individual items in the survey instrument on assault within VHA.

Total bar height in Figure 1 represents the proportion of employees in each occupational category who were assaulted at least once in the last year; the bar segments represent the frequency distribution of the perpetrator of the most recent event. Patients were

TABLE 2

Frequency of at Least One Assault Within the Last Year For All Occupations Combined

No. of times for each event	0		1		2		3		4		5		6–10		>10	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Thrown something that could hurt you	70,119	93.9	1974	2.6	819	1.1	404	0.5	246	0.3	167	0.2	153	0.2	780	1.0
Pushed, kicked, grabbed, slapped, hit you	67,549	90.5	2479	3.3	1439	1.9	770	1.0	415	0.6	370	0.5	389	0.5	1251	1.7
Hit you with an object	71,374	95.6	1283	1.7	590	0.8	256	0.3	142	0.2	119	0.2	104	0.1	794	1.1
Beat you up	73,530	98.5	246	0.3	76	0.1	50	0.1	40	0.1	32	0.0	25	0.0	663	0.9
Threatened with gun, knife, or other weapon	71,833	96.2	1249	1.7	457	0.6	195	0.3	107	0.1	68	0.1	48	0.1	705	0.9
Used gun, knife, or other weapon	73,619	98.6	180	0.2	76	0.1	47	0.1	34	0.0	32	0.0	19	0.0	655	0.9
Raped or attempted to rape you	73,753	98.6	108	0.1	37	0.0	37	0.0	28	0.0	19	0.0	16	0.0	664	0.9

**Fig. 1.** Proportion of individuals by occupation assaulted at least once on the last year with distribution of assault by perpetrator.

perpetrators of 64.4% of all assaults, overall. Individuals assaulted by co-workers were significantly younger; more likely to be nonwhite, veterans, and black; and belong to a lower pay grade. Occupational groups traditionally assumed to be of lower income or educational status (nursing aides, wage-grade employees) had higher absolute rates of assaults by coemployees.

Identification of triggers may lead to intervention strategies. Most pa-

tient assaults were triggered by “patient interactions,” whereas the majority of coemployee and supervisor events were triggered by “disputes about work.” Root causes of incidents were not included in the survey so that the authors are unable to provide further details. Figures 2 and 3 present the proportion of individuals experiencing at least 1 episode of assault as defined in traditional hospital departments and in “service lines.” There were substantial in-

creases in mental health, geriatrics, nursing, and police/security. Surprisingly, the Readjustment Counseling Service, which serves among the highest-risk group of patients, and social work had relatively low rates.

Although working, on average, higher numbers of hours per week was not associated with increased proportions of assault, frequent or very frequent nonstandard work assignments (floating, shift-switching, and mandatory overtime) were, with overall relative risks of 3.0, 3.4, and 6.0, respectively (data not presented). For registered nurses, alone, the risks were, respectively, 2.4, 2.6, and 3.3. Further analyses, by various subgroups, consistently showed the same pattern of increased associations.

Figure 4 presents the relationship between at least 1 assault in the last year and the predominant shift pattern. Any shift work was associated with a 3.2-fold risk of assault. Again, scrutiny within occupational groups such as all nurses showed a somewhat higher risk (3.8 fold risk). Figure 5 presents data on perceptions of security. Strikingly, nursing assistants and licensed practical nurses, the groups with the highest assault rates, also described feeling safest. Only 16% of respondents completed the section on perception of security

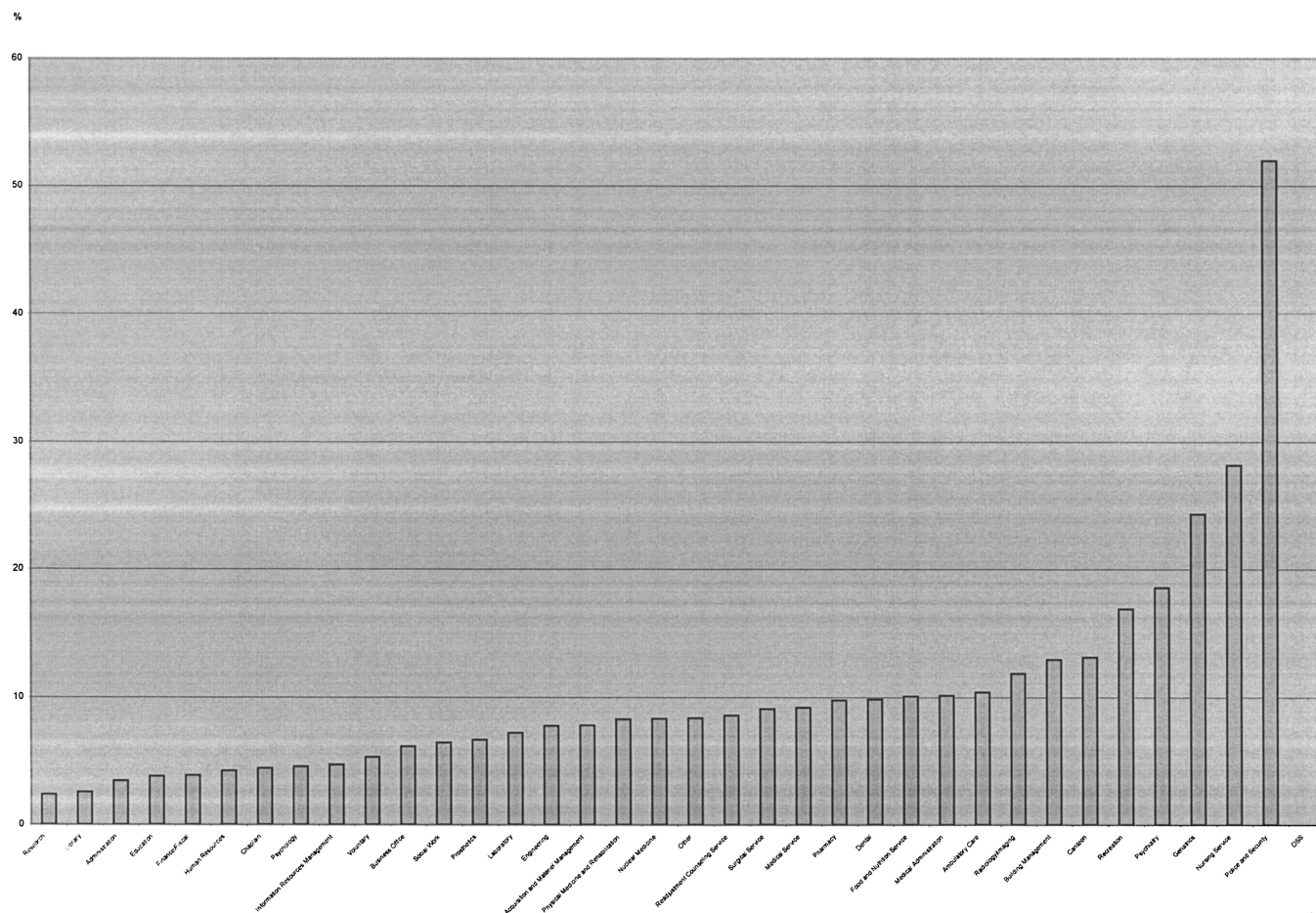


Fig. 2. Proportion of individuals assaulted at least once within the last year by service lines.

associated with infrastructure characteristics and those results were deemed too unreliable for presentation.

Scrutiny of assault frequencies and characteristics showed no differences between individuals with up to 10 assaults per year by increasing frequencies. On the other hand, individuals who described more than 10 assaults per year tended to be non-white, of lower GS-rating job categories, and older, with more than 20 years of service. In addition, the perpetrator of most recent incident was substantially more likely to be "other," ie, not patient, supervisor, coworker, patient family member, family member, or institutional customer. The cause was similarly not defined.

Regression models using the 2 meta-factors as independent variables

explored possible explanations of assault at the facility (Table 3). Approximately 18% of the variance for a logistic model ("at least 1 assault" vs. no assaults) was explained by the 2 meta-factors, employee focus and professional demands, and shift work, work assignments, and hours of work. Participation in alternative dispute resolution reduced the likelihood of assault by almost 40%. Data were then aggregated to the facility level, minimizing the influence of outliers and averaging out the perceptions of work climate as registered by individual respondents. At the facility level, 48% of the variance in assault rates was explained by the 2 meta-factors, hours of work, work assignments, any shift work, and the penetration of alternative dispute resolution (Table 3).

No relationship was seen between the proportion of individuals in each facility receiving training on prevention and management of disruptive behaviors over the 3 years before the survey and the proportion of assaults.

Discussion

A first issue to be discussed is whether a survey with a 36% response rate can yield results that are convincing or generalizable. Extrapolation of the number of assaults reported by quality managers in facilities to the total number of employees was within 10% of the total assaults identified in VHA in a survey 2 years previously,⁸ a survey with responses from over 95% of the facilities in the system. This suggests that no major over- or underreporting occurred in the 2001 survey. Similarly, there was no association be-

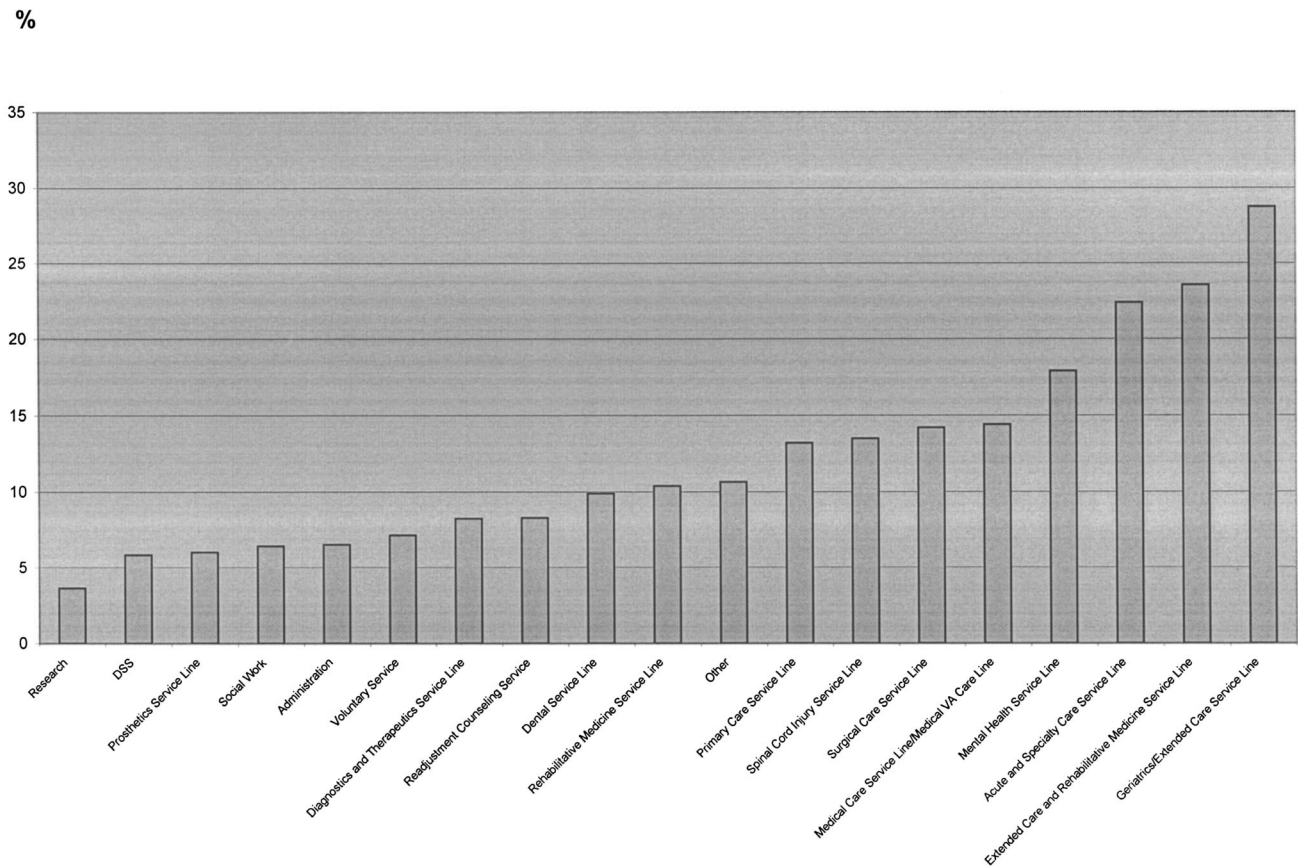


Fig. 3. Proportion assaulted at least once within the last year in traditional hospital departments.

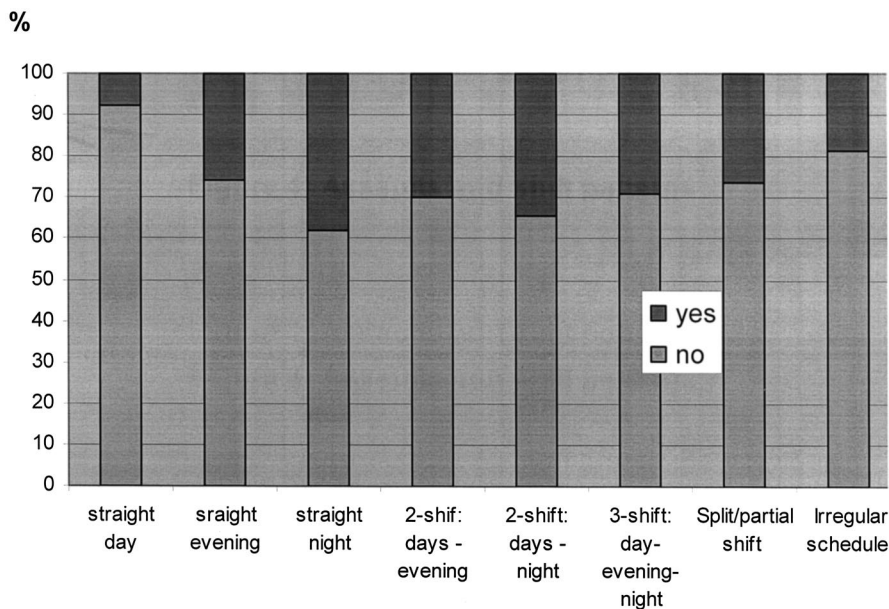


Fig. 4. Assaults and shift patterns.

tween response rate and the proportion of individuals assaulted in any given facility, suggesting that these two were in fact unrelated.

Health care is recognized as an occupation with over 50% of assaults in the United States, despite comprising less than 15% of the U.S. work-

force based on both federally reported injuries.⁵ Similarly, a random sample of the U.S. population⁶ suggested that mental health workers had a 4-fold and registered nurses an almost 2-fold risk. Some recent guidelines focus on the recommendations by OSHA.^{17,18} The data presented here suggest that most (85%) of the assaults experienced by clinical staff result from patient interactions and generally represent clinical issues resulting from patient care. When those are subtracted, health-care workers experience assaults at a rate substantially below those of postal service workers or the U.S. population as a whole.¹⁵ No other large healthcare organizations were willing to examine this issue, although VHA approached several potential partners so that we are unable to document that this is as widespread a problem as suggested by informal discussions. One reasonable

hypothesis is that direct patient contact, in which duration of patient contact serves as a measure of “dose,” represents one good measure of risk. This hypothesis appears both reasonable and supported by some evidence, because those with the higher rates (nursing assistants, wage-grade employees) also generally have higher rates of physical contact with others. Still, no specific measure of contact with patients or employees, as an “exposure” measure, exists in the survey instrument.

Areas such as geriatrics, mental health, and security have been re-

cently identified as high-risk areas in Canada; these employees may have contact with patients who are more likely to be assaulters.¹⁹ These specialty areas, and nursing in general, are at greater risk, at least in our system. If such risks can be extrapolated to other systems, these employee groups require training with a greater degree of urgency and intensity than other groups. Similarly, they will benefit from prompt initiation of other recognized effective interventions such as flagging.⁹

Whether individuals had received alternative dispute resolution did not

appear to affect the likelihood that they would be victims of assaults. On the other hand, the facility-wide penetration of such training was strongly associated with reduced rates of assault. More widespread awareness and skill development appears effective. The generally low penetration of specific violence prevention training was not associated with decreased assault rates, either because of low statistical power or because simply too few individuals have received such training.

Individuals experiencing assaults from coworkers appear to represent a different population. Some intervention strategies (such as the development of personal safety skills and deescalation abilities) may be effective for both. Some institutional strategies (environmental design) might be equally effective even though their overall effectiveness has been shown only in retail, cab driving, corrections, and community work.²¹ On the other hand, specific interventions targeted at root causes such as conflict in the workplace may require very different and far more targeted approaches because patient and coworker assaults appear to result from very different phenomena.

Several strategies appear important in the context of these results.

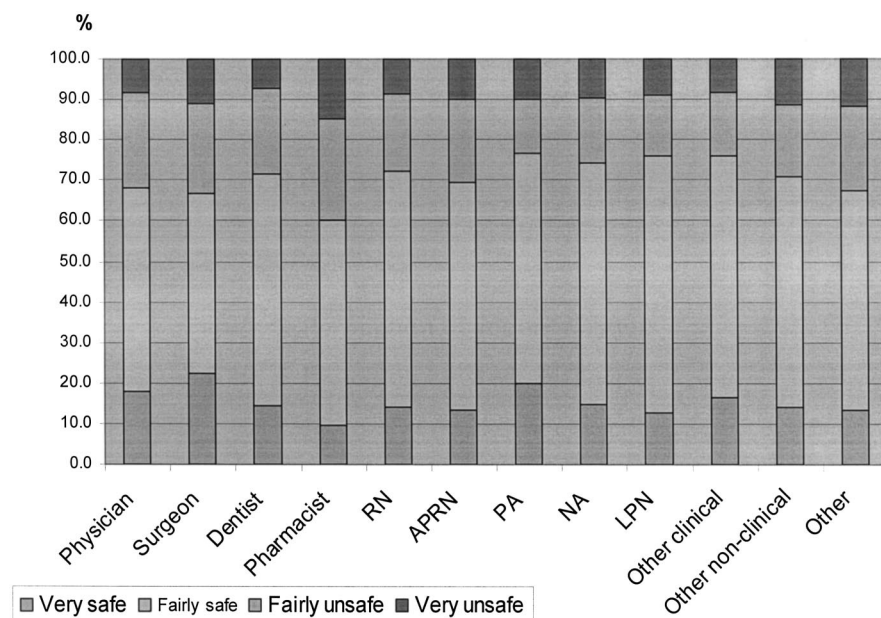


Fig. 5. Perception of security by job.

TABLE 3

Regression Models for Fitting Individual and Aggregated (Facility-Level) Data to Assault Outcomes

R2	Individual Level*			Facility†	
	Beta 0.183	P value	Odds ratio <0.001	Beta, .476	P value .001
Employee focus	-.007	0.789	0.993	-.336	0.000
Social support	-.250	<0.0001	0.779	0.116	0.187
Professional demands	-.47	<0.0001	0.624	0.061	0.419
Pay satisfaction	-.044	<0.0001	0.957	0.107	0.134
Any shiftwork	1.218	<0.0001	3.379	0.549	0.000
Floating	0.486	<0.0001	1.626	0.058	0.457
Mandatory overtime	0.685	<0.0010	1.983	0.076	0.346
Switching shifts	0.829	<0.000	2.291	-.112	0.175
Hours of work	0.003	<0.906	1.003	0.021	0.796
Alternative dispute resolution	0.015	<0.536	1.016	0.185	0.004

*Individual-level (logistic regression) beta coefficient, standard error, odds ratio, and P value (n = 72,349).

†Facility (linear regression) Beta coefficient standard error, and P value (n = 139).

First, understanding drivers of patient-associated violence is important. The increased frequency of assaults associated with work reassignments may be the result of a broad range of factors, from patient expectations to providers through co-worker support or individual fatigue associated with hours. Specific knowledge of patients²² clearly helps reduce violence. Little information on the direct pathway for the other factors is recognized. These must be scrutinized systematically for root causes and generate intervention and prevention strategies because even repeat assaulters may have identifiable triggers.

Second, although violence prevention education did not appear effective, the penetration of an 8-hour session on alternative dispute resolution was effective at the facility level. In addition to deescalation and personal safety skills, whose use is self-evident even if not documented statistically, other approaches to violence prevention appear warranted. The failure of general violence prevention education as opposed to alternative dispute resolution training may reflect the higher (by an order of magnitude) penetration of the latter, and suggests that institutional commitment to education, and training more people, may be as important a factor to making the workplace safer as great educational content.

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References

1. Peek-Asa C, Howard J. Workplace violence investigations by the California Division of Occupational Safety and Health, 1993–1996. *J Occup Environ Med*. 1999;41:647–653.
2. Peek-Asa C, Schaffer KB, Kraus JF, et al. Surveillance of non-fatal workplace assault injuries, using police and employers' reports. *J Occup Environ Med*. 1998;40:707–713.
3. Lanza ML, Campbell D. Patient assault: a comparison study of reporting methods. *J Nurs Qual Assur*. 1991;5:60–68.
4. Lehmann LS, McCormick RA, Kizer KW. A survey of assaultive behavior in Veterans Health Administration facilities. *Psychiatr Serv*. 1999;50:384–389.
5. Current Intelligence Bulletin 57 Violence: Risk Factors and Prevention Strategies. DHHS (NIOSH) Publication No. 96–100.
6. National Crime Victimization Survey web site. Available at: <http://www.ojp.usdoj.gov/bjs/cvict.htm>. Accessed September 30, 2002.
7. Aiken GJM. Assaults on staff in a locked ward: prediction and consequences. *Med Sci Law*. 1984;24:199–207.
8. Blow FC, Barry KL, Copeland LA, et al. Repeated assaults by patients in VA hospital and clinic settings. *Psychiatr Serv*. 1999;50:390–394.
9. Drummond D, Sparr LF, Gordon GH. Hospital violence reduction among high risk patients. *JAMA*. 1989;261:2531–2534.
10. Larkin E, Murtah S, Jones S. A preliminary study of violent incidents in a special hospital. *Br J Psychiatry*. 1988;153:226–231.
11. Lehmann LS, Padilla M, Clark S, et al. Training personnel in the prevention and management of violent behavior. *Hosp Community Psychiatry*. 1983;34:40–43.
12. Office of Personnel Management. Organizational Assessment Survey. Available at: http://www.opm.gov/employ/html/org_asse.asp. Accessed September 30, 2002.
13. Hurrell JJ Jr, McLaney MA. Exposure to job stress—a new psychometric instrument. *Scand J Work Environ Health*. 1988;14(suppl 1):27–28.
14. Hurrell JJ Jr, Nelson DL, Simmons BL. Measuring job stressors and strains: where we have been, where we are, and where we need to go. *J Occup Health Psychol*. 1998;3:368–389.
15. Goldstein N, et al. Report of the United States Postal Service Commission on a Safe and Secure Workplace. New York: National Center on Addiction and Substance Abuse at Columbia University; 2000.
16. Statistical Package for the Social Sciences, version 11.5. Chicago: SPSS, Inc.
17. Levin PF, Hewitt JB, Misner ST, et al. Assault of long-term care personnel. *J Gerontol Nurs*. 2003;29:28–35.
18. Rosen J. A labor perspective of workplace violence prevention. Identifying research needs. *Am J Prev Med*. 2001;20:161–168.
19. Hesketh KL, Duncan SM, Estabrooks CA, et al. Workplace violence in Alberta and British Columbia hospitals. *Health Policy*. 2003;63:311–321.
20. Allison DJ, Matthew RT. Facility design and security. In: Lion JR, Dubin WR, Futrell DE, eds. *Creating a Secure Workplace: Effective Policies and Practices in Health Care*. American Hospital Association; 1996.
21. Neuman O. Creating Defensible Space. Department of Housing and Urban Development, April 1996. Available at: <http://www.huduser.org/publications/pdf/def.pdf>. Accessed June 20, 2003.
22. Trenoweth S. Perceiving risk in dangerous situations: risks of violence among mental health inpatients. *J Adv Nurs*. 2003;42:278–287.